CLAIMS

1. A method for altering the level of hematopoietic progenitor cell adhesion to target tissue, comprising:

a) providing:

i) a population of cells comprising hematopoietic progenitor cells that express integrin α4β1,

ii) target tissue that is not bone marrow endothelial tissue, and

iii) one or more agent that alters specific binding of integrin α4β1 to an integrin α4β1 ligand, and

b) treating one or more of said population of cells and said target tissue with said agent under conditions for specific binding of said integrin α4β1with said integrin α4β1 ligand, thereby altering the level of adhesion of said hematopoietic progenitor cells to said target tissue.

2. The method of Claim 1, wherein said treating further comprises altering the level of trans-endothelial migration of said hematopoietic progenitor cells.

3. The method of Claim 1, wherein said treating further comprises altering the level of differentiation of said hematopoietic progenitor cells into a second cell type.

4. The method of Claim 3, wherein said second cell type is not a bone marrow endothelial cell.

5. The method of Claim 4, wherein said second cell type comprises one or more of mesenchymal cell, epithelial cell, muscle cell, neuronal cell, immune cell, melanocyte cell, myoepithelial cell, and embryonic cell.

6. The method of Claim 1, wherein said target tissue comprises one or more of vascular endothelial, muscle, neuronal, tumor, inflammatory, peripheral blood, cord blood, heart, ocular, skin, synovial, tumor, lung, breast, prostate, cervical, pancreatic, colon, ovarian, stomach, esophageal, mouth, tongue, gum, skin, liver, bronchial, cartilage, testis, kidney, endometrium, uterus, bladder, spleen, thymus, thyroid, brain, neuron, gall bladder, ocular, and joint tissues.

7. The method of Claim 1, wherein said tissue is injured.

8. The method of Claim 1, wherein said tissue is ischemic.

9. The method of Claim 1, wherein said target tissue comprises fibronectin.

10. The method of Claim 1, wherein said target tissue comprises vascular tissue.

11. The method of Claim 1, wherein said treating is *in vitro*.

12. The method of Claim 1, wherein said treating is *in vivo* in a mammalian subject.

13. The method of Claim 12, wherein said mammalian subject is chosen from one or more of a subject that has a disease, is susceptible to having a disease, is suspected of having a disease, and is suspected of being susceptible to having a disease.

14. The method of Claim 13, wherein said mammalian subject is human.

15. The method of Claim 13, wherein said disease is angiogenic.

16. The method of Claim 13, wherein said disease is not angiogenic.

17. The method of Claim 1, wherein said agent comprises an antibody.

18. The method of Claim 17, wherein said antibody comprises an anti-integrin $\alpha 4\beta 1$ antibody.

19. The method of Claim 17, wherein said antibody comprises an anti-vascular cell adhesion molecule antibody.

20. The method of Claim 17, wherein said antibody comprises an anti-fibronectin antibody.

21. The method of Claim 1, wherein said ligand comprises vascular cell adhesion molecule (VCAM).

22. The method of Claim 1, wherein said ligand comprises fibronectin.

23. A method for screening a test compound for altering the level of hematopoietic

progenitor cell adhesion to target tissue that is not bone marrow endothelial tissue, comprising:

a) providing:

i) a first composition comprising integrin α4β1,

ii) a second composition comprising one or more integrin α4β1 ligand, and

iii) a test compound,

b) contacting said test compound with one or more of said first composition and said second composition under conditions for specific binding of said integrin α4β1with said integrin α4β1 ligand, and

c) detecting an altered level of specific binding of said integrin α4β1with said integrin α4β1 ligand in the presence of said test compound compared to in the absence of said test compound, thereby identifying said test compound as alerting the level of hematopoietic progenitor cell adhesion to said target tissue.

24. The method of Claim 23, wherein said method further comprises identifying said test compound as altering the level of trans-endothelial migration of said hematopoietic progenitor cells.

25. The method of Claim 23, wherein said method further comprises identifying said test compound as altering the level of differentiation of said hematopoietic progenitor cells to a second cell type.

26. The method of Claim 25, wherein said second cell type is not a bone marrow endothelial cell.

27. The method of Claim 26, wherein said second cell type comprises one or more of mesenchymal cell, epithelial cell, muscle cell, neuronal cell, immune cell, melanocyte cell, myoepithelial cell, and embryonic cell.

28. The method of Claim 23, wherein said target tissue comprises one or more of vascular endothelial, muscle, neuronal, tumor, inflammatory, peripheral blood, cord blood, heart, ocular, skin, synovial, tumor, lung, breast, prostate, cervical, pancreatic, colon, ovarian, stomach, esophageal, mouth, tongue, gum, skin, liver, bronchial, cartilage, testis, kidney, endometrium, uterus, bladder, spleen, thymus, thyroid, brain, neuron, gall bladder, ocular, and joint tissues.

29. The method of Claim 23, wherein said contacting is *in vitro*.

30. The method of Claim 23, wherein said contacting is *in vivo* in a non-human mammal.

31. A method for isolating hematopoietic progenitor cells from a tissue, comprising:

a) providing:

i) a tissue comprising hematopoietic progenitor cells, and

ii) an antibody that specifically binds to integrin $\alpha 4\beta 1$,

b) treating said tissue with said antibody under conditions such that said antibody specifically binds to said integrin $\alpha 4\beta 1$, and

c) isolating the integrin $\alpha 4\beta 1$ that binds to said antibody, thereby isolating said hematopoietic progenitor cells.